

What is claimed is:

1. In a bias applying device configured to form, at each of image transfer positions where a plurality of image carriers and an image transfer belt moving in contact with surfaces of said plurality of image carriers, an electric field for transferring a toner image formed on a respective image carrier to a transfer medium key applying a bias to said image transfer belt,

said bias applying device comprising:

a plurality of bias sources each for applying the bias to said image transfer belt at a respective image transfer position;

a plurality of high-potential power supplies each being connected to one of said plurality of bias sources for applying a bias, of a DC component and a particular AC component superposed on said DC component, to respective bias sources;

a plurality of sensors each being connected to one of said plurality of bias sources for sensing the AC component of the bias of respective bias sources; and

a central processing unit configured to control said plurality of high-tension power supplies and said plurality of sensors;

a bias applying method for said bias applying device

comprising the steps of:

detecting an AC component of a second high-tension power supply, which is detected at an output of a first high-tension power supply;

determining an AC resistance between said first high-tension power supply and said second high-tension power supply on the basis of an absolute value of the AC component detected;

estimating a leak current of a DC component by referencing a table listing a correlation between AC resistances and DC resistances and prepared beforehand; and

adding the leak current to a set DC value assigned to said first high-tension power supply to thereby correct the bias.

2. In a bias applying device configured to form, at each of image transfer positions when a plurality of image carriers and an image transfer belt moving in contact with surfaces of said plurality of image carriers, an electric field for transferring a toner image formed on a respective image carrier to a transfer medium by applying a bias to said image transfer belt, said bias applying device comprising:

a plurality of bias sources each for applying the bias to said image transfer belt at a respective image transfer position;

a plurality of high-potential power supplies each being connected to one of said plurality of bias sources for applying a bias, of a DC component and a particular AC component superposed on said DC component, to respective bias sources;

a plurality of sensors each being connected one of said plurality of bias sources for sensing the AC component of the bias of respective bias sources; and

a central processing unit configured to control said plurality of high-tension power supplies and said plurality of sensors;

a bias applying method for said bias applying device comprising the steps of:

causing each of said high-tension power supplies to apply a DC component on which alternating biases perpendicular to each other are superposed to particular bias sources;

selectively detecting said alternating biases to thereby measure an absolute value;

calculating, based on said absolute value, a resistance between nodes;

estimating a coupling impedance corresponding to the resistance and a leak current to appear when the DC component is applied alone; and

adding the leak current to an original target DC current to thereby correct the bias.

3. A bias applying device configured to form, at each of image transfer positions where a plurality of image carriers and an image transfer belt moving in contact with surfaces of said plurality of image carriers, an electric field for transferring a toner image formed on a respective image carrier to a transfer medium by applying a bias to said image transfer belt, said bias applying device comprising:

a plurality of bias sources each for applying the bias to said image transfer belt at a respective image transfer position;

a plurality of high-potential power supplies each being connected to one of said plurality of bias sources for applying a bias, of a DC component and a particular AC component superposed on said DC component, to respective bias sources;

a plurality of sensors each being connected one of said plurality of bias sources for sensing the AC component of the bias of respective bias sources;

a central processing unit configured to control said plurality of high-tension power supplies and said plurality of sensors; and

a bias correcting controller configured to detect an AC component of a second high-tension power supply, which is detected in the vicinity of an output of a first high-tension power supply, determine an AC resistance between said first high-tension power supply and said second high-tension power supply on the basis of an absolute value of said AC component detected, estimate a leak current of a DC component by referencing a table listing a correlation between AC resistances and DC resistances and prepared beforehand, and add said leak current to a set DC value assigned to said first high-tension power supply to thereby correct the bias.

4. The device as claimed in claim 3, wherein said high-tension power supplies each comprise a constant current DC generating device capable of setting a DC component, and a constant voltage AC generating device capable of setting a frequency beforehand and capable of being ON/OFF controlled.

5. The device as claimed in claim 3, wherein said sensors each are connected to the output of the respective high-tension power supply and reduce a frequency contained in an output of said respective high-tension power supply section with a notch filter and then detect said output to thereby output the absolute value of the AC component.

6. An image forming apparatus comprising:

a plurality of image forming units each comprising an image carrier for forming a latent image thereon, a latent

image forming unit configured to form said latent image on said image carrier, a developer configured to develop said latent image to thereby produce a corresponding toner image, an image transfer unit configured to transfer said toner image to a transfer medium, and an image transfer belt movable in contact with surfaces of the image carriers of said plurality of image forming units;

said image transfer unit comprising a bias applying device configured to form, at each of image transfer positions where a plurality of image carriers and an image transfer belt moving in contact with surfaces of said plurality of image carriers, an electric field for transferring a toner image formed on a respective image carrier to a transfer medium by applying a bias to said image transfer belt;

said bias applying device comprising:

a plurality of bias sources each for applying the bias to said image transfer belt at a respective image transfer position;

a plurality of high-potential power supplies each being connected to one of said plurality of bias sources for applying a bias, of a DC component and a particular AC component superposed on said DC component, to respective bias sources;

a plurality of sensors each being connected to one of said plurality of bias sources for sensing the AC component of the bias of respective bias sources;

a central processing unit configured to control said plurality of high-tension power supplies and said plurality of sensors; and

a bias correcting controller configured to detect an AC component of a second high-tension power supply section, which is detected in the vicinity of an output of a first high-tension power supply, determine an AC resistance between said first high-tension power supply and said second high-tension power supply on the basis of an absolute value of said AC component detected, estimate a leak current of a DC component by referencing a table listing a correlation between AC resistances and DC resistances and prepared beforehand, and add said leak current to a set DC value assigned to said first high-tension power supply to thereby correct the bias.

7. The apparatus as claimed in claim 6, wherein said high-tension power supplies each comprise a constant current DC generating device capable of setting a DC component, and a constant voltage AC generating device capable of setting a frequency beforehand and capable of being ON/OFF controlled.

8. The apparatus as claimed in claim 6, wherein said sensors each are connected to the output of the respective high-tension power supply and reduce a frequency contained in an output of said respective high-tension power supply with a notch filter and then detect said output to thereby output the absolute value of the AC component.